



Emergency Preparedness in Georgia: An Assessment of Public Health Training Needs

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ABSTRACT

In order to maintain a strong front against both terrorist and natural threats, it is incumbent upon the public health system to employ workers who possess the skills and knowledge required to protect the health of the nation. The aim of this study is to contribute to an understanding of the learning needs of the public health workforce as the needs relate to bioterrorism and emerging health threats. The findings of a competency-based needs assessment conducted for public health workers in the state of Georgia will be presented. Specifically, this study uses data collected from Georgia public health workers to: 1) identify the bioterrorism and emerging health threat competencies that are regarded as “important” and “very important” to job responsibilities; and 2) the corresponding self-reported current levels of ability for those competencies. The findings show a gap between the job responsibilities and the related abilities of Georgia’s public health workforce. Although there is significant variability in the extent of these differences, it is apparent that the gap persists across all competencies.

The unprecedented events of recent years, including the terrorist attacks of September 11, 2001, anthrax being sent through the postal system, and the SARS outbreak, have brought heightened attention and a sense of urgency to the topic of public health preparedness. In order to maintain a strong front against both terrorist and natural threats, it is incumbent upon the public health system to employ workers who possess the skills and knowledge required to protect the health of the nation.

In 1988, the Institute of Medicine’s (IOM) Committee for the Study of the Future of Public Health reported the need for extensive capacity-building within public health through training and education.¹ This landmark report served as a catalyst for widespread dialogue, planning, and activities geared toward the development of

the public health workforce.² In 2002, the Committee on Assuring the Health of the Public in the 21st Century released a follow-up to the IOM’s 1988 report, again stressing the need for a strong governmental public health infrastructure. According to the 2002 report, major challenges within the public health system included: a lack of training and reinforcements within the workforce, and incomplete domestic preparedness and emergency response capabilities.³ *Healthy People 2010* echoes these priorities by stating “there is an ongoing need to train and educate people who are currently employed in public health as new areas, problems, threats, and potential disasters emerge.”⁴ Finally, *The Public Health Workforce: An Agenda for the 21st Century* and *Strategic Plan for Public Health Workforce Development* voices the need for training the

current public health workforce, charging local health agencies with the responsibility for fostering individual and organizational training and education.^{5,6}

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Competency-based practice in public health workforce development was first addressed in the 1988 IOM report, and since that time the recognition that competencies need to be tied to public health practice has become widespread.⁷⁻⁹ Generally speaking, an individual demonstrates competency in a certain skill when he or she is able to perform and sequence actions to attain a specific goal. Lucia and Lepsinger provide a more detailed view of competency, defining the term as “a cluster of related knowledge, skills, and attitudes that affects a major part of one’s job (a role or responsibility), that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development.”¹⁰ As such, it remains critical that competency statements articulate specific performance levels so that progress and success are measurable and meaningful.¹¹

Competency-based frameworks are based on the assumption that larger job responsibilities can be broken down into individual components, representing sequential building blocks of abilities. The use of these frameworks in workforce development helps to shape three primary functions: needs assessment, training design, and evaluation. Needs assessment is particularly important for workforce development, given that limited information has been collected on the number of public health workers in the United States, their educational or professional backgrounds, and their skill sets.¹²⁻¹⁴ Acquiring and maintaining up-to-date information remains critical as needs assessment data can be used towards the planning and implementation of appropriate and effective workforce development programs.^{9,11,13,15}

On-the-job training is essential for public health workers, given that the profession draws from a wide range of disciplines, educational backgrounds, and expertise.^{2,9} The majority of public health workers—estimated at more than three quarters of the workforce—has little or no formal education or training in public health. As a result, on-the-job training and experience are

often the largest contributors to public health preparedness.¹¹

The use of competencies also assists in evaluating the efficacy of training programs and monitoring the progress of individual workers. When properly applied, competencies provide measurable units that can determine the extent to which skills and/or knowledge have been acquired or developed. Furthermore, understanding the baseline competencies and composition of the public health workforce provides a measure against which progress may be gauged and additional needs identified.

The aim of this study is to contribute to an understanding of the learning needs of the public health workforce as they relate to bioterrorism and emerging health threats by addressing two research questions: 1) According to members of Georgia’s public health workforce, which bioterrorism and emerging health threat competencies are regarded as “important” or “very important” to job responsibilities?; and 2) Within those competencies identified as important or very important, what are the self-reported current levels of ability of Georgia’s public health workforce?

METHODS

In the 1990s, the Centers for Disease Control and Prevention’s (CDC) Public Health Practice Program Office (PHPPO) coordinated the establishment of national and regional leadership development projects, which later included financial allotments earmarked for emergency preparedness.¹¹ A system of Centers for Public Health Preparedness was launched in 2000 by the CDC through a cooperative agreement with the Association of Schools of Public Health (ASPH) in an effort to improve the competency of public health workers responding to health threats related to bioterrorism, infectious disease outbreaks, and health emergencies.¹⁶

The Emory Center for Public Health Preparedness (CPHP) was funded in July 2002 to serve Georgia’s public health workforce. As part of its preparedness efforts, Emory’s CPHP, in conjunction with

the Georgia Division of Public Health (GDPH), developed a Web-based needs assessment and course management system for Georgia’s public health workers. The system—known as G-TRAIN (Georgia Training Resource And Inventory Network)—compiles user profile and needs assessment data and maintains a course catalogue of training resources.

Data Collection

The needs assessment tool in G-TRAIN assists users in identifying their personal training priority areas and allows administrators to track aggregate data. Prior to completing the needs assessment, users identify themselves as either clerical/administrative or frontline worker/management/leader, a classification that determines whether they complete the Tier 1 or Tier 2 Core Public Health, Terrorism, and Emergency Preparedness Competency Assessment. Tier 1 is a shorter assessment, intended for public health workers who are charged primarily with administrative duties, while Tier 2 is more in-depth and covers the rest of the workforce, including different levels of management and variously skilled workers.

Both tiers include eight competency-related domains: 1) analytic/assessment skills; 2) policy development/program planning skills; 3) communication skills; 4) cultural competency skills; 5) community aspects of public health practice; 6) basic public health sciences skills; 7) financial planning and management skills; and 8) leadership and systems thinking skills. Each domain is made up of competencies that are either *core* or *bioterrorism* (with the exception of domains seven and eight in Tier 1). Core competencies reflect skills and knowledge that pertain to the central functions undertaken by public health workers on a regular basis. Bioterrorism competencies relate to the role of public health workers in both preparing for and responding to emergency events. For each competency, participants are asked to rate importance to job responsibilities (ranging from 1—*not important at all* to 5—*very important*) and current level of abilities (ranging from 1—*no ability at all* to 5—*very high ability*) according to five-point



Likert scales.

Participants

The study sample consists of public health workers in the state of Georgia who completed the G-TRAIN user profile and needs assessment. There are no eligibility requirements for participation other than respondents being employed by the state in the field of public health (at a local, district, or state level), and have access to the Internet. Participation in the G-TRAIN program is voluntary, and individual responses are confidential. All entries completed prior to May 25th, 2004 were used in the data analysis.

Analysis

Data from the G-TRAIN program were exported into Microsoft Excel 4.0 and then into SPSS 11.5 for Windows. The data were used to make comparisons between ratings of "How important to your current job responsibilities?" and "What is your current level of ability?" for all bioterrorism competencies.

RESULTS

For all bioterrorism competencies within both Tier 1 (n=1,201) and Tier 2 (n=1,349), the average reported current level of ability was lower than the average importance to job responsibilities. This indicates a tendency for G-TRAIN users to report that the competencies are important to their job, but that their abilities do not necessarily measure up. Figures 1 and 2 are line graphs illustrating the two categories of responses for Tier 1 and Tier 2, respectively.

Demographics

As shown in Table 1, the majority of the G-TRAIN respondents for both tiers were female: 94.3% in Tier 1; 83.5% in Tier 2. In both tiers the mean age was similar: 43.7 years in Tier 1 (minimum=18.1; maximum=80.4); 44.2 in Tier 2 (minimum=21.2; maximum=81.2). The majority of respondents identified themselves as white (64.6% in Tier 1; 76.4% in Tier 2); and black was the next highest percentage (30.2% in Tier 1; 20.8% in Tier 2).

Within Tier 1, the highest percentage of

Figure 1. Percentage of Tier 1 Respondents Reporting Important or Very Important to Job Responsibilities Compared with Percentage of Same Reporting High Ability or Very High Ability, by Bioterrorism Competency and Domain

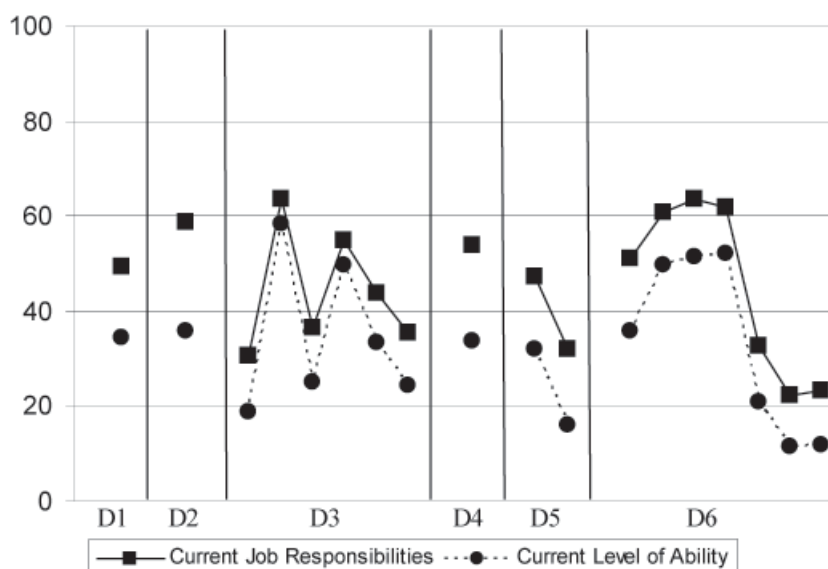
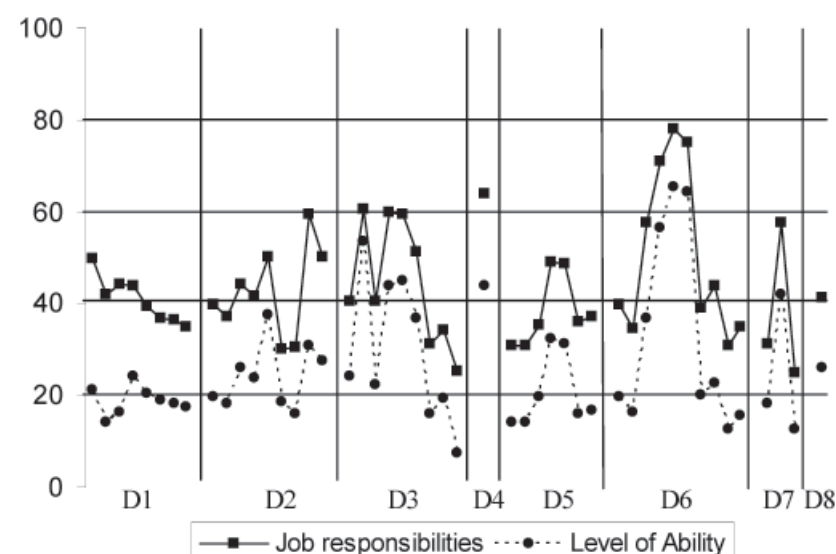


Figure 2. Percentage of Tier 2 Respondents Reporting Important or Very Important to Job Responsibilities Compared with Percentage of Same Reporting High Ability or Very High Ability, by Bioterrorism Competency and Domain



respondents reporting higher education earned a degree at a vocational/technical school (30.0%), followed by Bachelor's de-

gree (12.8%), and Associate's degree (10.3%). In Tier 2, the majority of respondents had completed a Bachelor's degree

**Table 1. Percentage of Respondents by Sex, Age, Race, and Hispanic Origin, According to Tier**

Demographic variable	Tier 1 (n=1202) %	Tier 2 (n=1349) %	Total %
Sex:			
Female	94.3	83.5	88.6
Male	5.7	16.5	11.4
Age*:			
24 and under	3.0	1.1	2.0
25–34	18.8	21.1	20.1
35–44	29.0	24.5	26.6
45–54	31.6	35.6	33.7
55–64	16.0	16.9	16.5
65 and older	1.6	0.7	1.1
Race:			
American Indian, Eskimo, and Aleut	0.0	0.0	0.0
Asian and Pacific Islander	.8	1.5	1.2
Black	30.2	20.8	22.8
White	64.6	76.4	73.1
Other	4.3	1.3	2.8

*Note. Age was not a required field; therefore, this category had fewer responses (Tier 1 n=1083; Tier 2 n=1216).

Table 2. Percentage and Number of Respondents by Higher Education Degree, According to Tier

Higher education degree	Tier 1 (n=1202) %	Tier 2 (n=1349) %	Total %
Vocational Tech	30.3	11.7	20.5
Associate	10.3	27.0	19.1
Bachelors	12.8	58.9	37.2
Masters	1.9	20.3	11.7
Non-medical degree	0.6	1.6	1.1
Medical degree	0.9	3.1	2.1

(58.9%), with relatively high percentages also reporting having completed Associate's (27.0%) and Master's degrees (20.3%).

Research Questions

Importance to Job Responsibilities

For both Tier 1 and Tier 2, the averages of responses related to importance to job responsibilities covered a wide range. For each statement in Tier 1, between 22.1% and 63.6% of the respondents indicated

that the competency was either important or very important. Similarly, each statement in Tier 2 was rated as important or very important by between 24.9% and 77.9% of respondents. Given that the lowest averages for Tiers 1 and 2 were each close to 25%, none of the competencies can be ruled out as unimportant to Georgia's public health workforce. The first data column in Table 3 represents the competencies within both

Tier 1 and Tier 2 that had the highest average responses of "important + very important."

Current Ability

Without exception, the self-reported levels of ability for Georgia's public health workforce were lower than the responses regarding importance to job responsibilities for the bioterrorism competencies. Table 3 provides a comparison between the percentage of respondents that rated competencies as important or very important with those who reported having high or very high ability in those competencies, as well as the calculated difference between the two.

DISCUSSION

Within Tier 1, three competencies had a 15% or greater difference between reported importance and ability: "knows written policies, procedures, and plans in an emergency event;" "includes the requirements of people with special needs (e.g., language, disability, age) in emergency planning;" and "performs assigned functional roles in emergency response."

The most drastic difference among these three was the competency regarding knowledge of emergency-related written policies, procedures, and plans. Approximately 59% of respondents felt that this was an important part of their job responsibilities, yet only 35.9% rated their abilities as high (difference=22.8%). This shows a clear training need that depends not only on the ability of the state to provide the training, but also on the existence of such policies, procedures and plans. Likewise, the competency pertaining to performance of "assigned functional roles in emergency response" begs the question of whether or not the gap stems from insufficient training, or from nonexistent or underdeveloped policies and procedures for emergency response (on which training would be based). Finally, the competency pertaining to people with special needs also had a relatively wide margin between responsibilities and skills. This may point to a turning tide within both public health and many other professions—that people's awareness re-



garding cultural competency is perhaps outpacing policies and agendas that support formal implementation.

Tier 2 had several more competencies with a 15% or greater difference between responsibilities and abilities. Like Tier 1, the competencies pertaining to special needs requirements, knowledge of written policies and procedures, and performance of assigned functional roles were all identified as having a 15% or greater difference (differences of 20.1%, 28.6%, and 20.7%, respectively). The largest difference for Tier 2 was the competency addressing the knowledge of written policies and procedures for emergency response (noted above); followed by “implements written emergency response plans” (22.5%).

Themes

Several themes can be identified that highlight some basic priority areas for training the public health workforce in Georgia. 1) service provision; 2) policies, procedures, and plans; and 3) communication.

The “service provision” theme reflects the need for public health workers to plan for and include different segments of the population in supplying access to and quality of health treatment. Foremost in this theme was the competency related to planning for and responding to the needs of populations with special needs. A second high-priority competency dealt with ensuring access to medical assessment and treatment for different populations.

The “policies, procedures, and plans” theme refers to workers’ knowledge of and ability to perform and/or implement policies, procedures, and plans in an emergency event. As noted earlier, this relies on the existence and accessibility of such plans, along with preparation for proper implementation. Also included in this theme is a competency that relates to maintaining appropriate resources, such as manuals and directories, for use in an emergency event.

“Communication” is the final theme, which refers to the ability to relay necessary information to public health partners to facilitate the response to an emergency. In addition, it relates to the ability to communicate effectively to different audiences during

an event.

Social Cognitive Theory

Albert Bandura’s social cognitive theory postulates that human behavior is guided by a triadic, dynamic, and reciprocal model involving personal factors, environmental influences, and behavior.¹⁷ According to this model, behavior adaptation and modification are influenced by a person’s own sense of his or her needs and abilities, along with forces in the environment which may enable or hinder his or her conduct. Within the context of this theory these findings suggest that in general the behavior expectancies (the belief that respondents’ jobs require certain functional competencies) and behavioral capability (the knowledge and skills required to perform those competencies) are not well aligned. At first glance this disparity between responsibilities and skills may lead to an assumption that additional training and education is needed in order to close the gap. Although this assumption may very well be accurate, the social cognitive theory provides additional perspectives that are also worthy of consideration.

As noted above, the social cognitive model asserts that one component of a person’s behavior adaptation and modification is his or her own sense of needs and abilities. Accordingly, providing public health workers with the opportunity to consider their abilities and identify areas in which their skills are lacking has the potential to lend itself to the process of behavior adaptation—which, in this case, is the pursuit of additional training or education. On the flip side, however, are those individuals who did not report insufficient skills, yet in reality are deficient in skills, for which behavior modification could potentially be stunted by a lack of awareness.

The social cognitive theory also considers the role of one’s environment in supporting or impeding behavior change. In the case of worker preparedness, the environment may include: availability of

resources to sustain training initiatives (including funds and the allocation of time); leadership that is supportive of employee training; and the framework or information on which training would occur.^{2,18,19} This final aspect is especially important in the context of the findings of this study, given that many of the worker roles and responsibilities are tied to knowledge of and the ability to act upon specific policies, procedures, and regulations in responding to an emergency event. It therefore becomes necessary to know whether or not the policies and procedures actually exist and/or have been made available to the appropriate personnel.

Limitations

Several limitations of this research relate to the manner in which the data were collected. First, the analysis and conclusions were based on data that were self-reported by respondents at a time and under the circumstances of their choice. The potential for this limitation is compounded by the fact that the instrument was relatively lengthy (especially for those respondents who completed the Tier 2 competency statements) and that access to computers and the Internet can be difficult within public health offices around the state. Furthermore, unwillingness to answer candidly could stem from a fear that respondents’ answers could be used against them by their employers; from a general distrust of questionnaires and/or submitting information on the Internet; and/or a belief that the questions did not pertain to them.

This self-reported method of data collection also assumes that the respondents are fully aware of their job responsibilities and respective abilities. It is possible that some respondents did not entirely understand their roles as public health workers, or that the information had not been communicated to them by their employers. Similarly, the manner in which respondents were directed to Tier 1 or Tier 2 needs assessments may have caused some misreporting of data. Classification was based on respondents self-identifying their professional identity as administrative (which

**Table 3. Tier 1 and Tier 2 Differences in Percentages Between Important and Very Important Job Responsibilities Compared with High Ability and Very High Ability, Listed by Bioterrorism Competency and Domain**

Tier 1			
Competency (Domain)	Job %	Ability %	Diff %
Describes how to receive and send data and information using available communication technologies. (3—Communication)	63.6	58.2	5.4
Accesses needed resources when situations are beyond own knowledge/skill/authority. (6—Basic Public Health Sciences)	63.5	51.5	12.0
Uses proper safety and personal protection procedures and equipment. (6—Basic Public Health Sciences)	61.8	52.1	9.7
Acts within limits of own knowledge/skill/authority during an emergency event. (6—Basic Public Health Sciences)	60.8	49.5	11.3
Knows written policies, procedures, and plans in an emergency event. (2—Policy Development/Program Planning)	58.7	35.9	22.8
Uses appropriate equipment for communication during an emergency (e.g., phone, fax, two-way radio, computer). (3—Communication)	54.9	49.6	5.3
Includes the requirements of people with special needs (e.g., language, disability, age) in emergency planning and activities. (4—Cultural Competency)	53.9	33.6	20.3
Performs assigned functional roles in emergency response. (6—Basic Public Health Sciences)	51.0	35.8	15.2
Tier 2			
Competency (Domain)	Job %	Ability %	Diff %
Accesses needed resources when situations are beyond own knowledge/skill/authority. (6—Basic Public Health Sciences)	77.9	65.4	12.5
Uses proper safety and personal protection procedures and equipment. (6—Basic Public Health Sciences)	75.2	64.2	11.0
Acts within limits of own knowledge/skill/authority during an emergency event. (6—Basic Public Health Sciences)	71.0	56.5	14.5
Includes the requirements of people with special needs (e.g., language, disability, age) in emergency response planning and activities. (4—Cultural Competency)	63.9	43.8	20.1
Describes how to receive and send data and information using available communication technologies (e.g., email, radio, fax, telephone). (3—Communication)	60.5	53.5	7.0
Uses appropriate communication strategies for a given audience (e.g., media, other agencies, health providers, general public). (3—Communication)	60.0	44.0	16.0
Knows written policies, procedures, and plans in an emergency event. (2—Policy Development/Program Planning)	59.5	30.9	28.6
Uses appropriate equipment for communication during an emergency (e.g., phone, fax, two-way radio, computer). (3—Communication)	59.3	45.1	14.2
Follows discipline-specific (e.g., nurse, environmentalist, epidemiologist) protocols for emergency response. (7—Financial Management and Planning)	57.7	42.1	15.6
Performs assigned functional role(s) in emergency response. (6—Basic Public Health Sciences)	57.6	36.9	20.7
Communicates information and procedures to Public Health's partners (e.g., health care providers, first responders, emergency management personnel) to facilitate the response to an emergency. (3—Communication)	51.2	36.7	14.5
Follows policies and procedures for specimen collection, rapid identification, and electronic reporting of results. (2—Policy Development/Program Planning)	50.3	37.7	12.6
Implements written emergency response plans. (2—Policy Development/Program Planning)	50.1	27.6	22.5



directed them to Tier 1) or otherwise (Tier 2). Upon examination of the data, however, it became apparent that at least one hundred respondents had improperly categorized themselves.

Another limitation of these data is the exclusive focus on the training needs of public health workers within Georgia who were employed by the state. As such, it may not reflect information that is generalizable to other states, regions, or the United States as a whole, or to public health workers within the private sector. Finally, the generalizability even to the state of Georgia is potentially threatened by the fact that some segments of the state public health workforce are not represented.

Implications of research

Understanding the job responsibilities and related abilities of Georgia's public health workforce is an essential first step to preparing appropriate emergency preparedness curriculum. The competency-based structure of this needs assessment provides information on very specific units of abilities around which targeted learning can occur. The information collected also provides critical data for evaluating the progress and performance of agencies and individuals.^{11,20} The findings of this study provide baseline data against which training programs could be evaluated—allowing public health leaders to continue and/or expand successful programs and eliminate or modify ineffective ones.

Furthermore, although preparedness for the event of a terrorist act is a priority within public health, the skills and knowledge needed to respond to an intentional event are often also required also for emergency response to more common occurrences, such as floods, fires, and other natural disasters or outbreaks. The result of enhanced bioterrorism preparedness, therefore, can have a positive spillover effect into other areas of emergency planning as well as core public health functions.

Future Research

The research described here is a starting point for a more comprehensive understanding of the emergency preparedness

needs of Georgia's public health workforce. Future research could follow the process described here to determine the training needs of public health for these core functions and combine those findings with the information presented in this study to provide a more comprehensive training map for Georgia's public health workers.

As a means of validating the competencies used in this study, research could be conducted that compares the self-reported job responsibilities to other sources, such as experts in the field, supervisors within public health, etc. Furthermore, as suggested by Turnock, measurement of competencies obtained from direct experiences, such as performance during exercises and actual events, can provide the most useful insights about training priorities and needs.¹¹ Studies such as these could allow researchers to investigate the extent to which respondents' perceptions of their own job responsibilities are consistent with the standards of the field and the expectations of their managers and administrators; as well as the extent to which the competencies are effective predictors of success in performing their roles.

Finally, the data presented in this study are aggregate, yet given the wide range of roles intrinsic to public health, an important task for future research is breaking down the data and examining the characteristics of sub-populations. Local area data are an important consideration, as are data that are particular to different professions, such as epidemiology, public health nursing, and health education.

CONCLUSION

Information is a powerful tool for overcoming training needs, yet cannot stand alone. In order to be effective, workforce development must represent an entire package consisting of up-to-date and accurate information, as well as stable institutions that support ongoing assessment and education. Training alone will not ensure competency, yet approaching workforce development in a consistent, systematic manner will provide public health with the neces-

sary means to continue defending the health of the nation. Furthermore, a needs assessment of this scope cannot be a one-time occurrence. As circumstances in the world and in the state of Georgia continue to change and new challenges surface, the public health workforce will be required to transform and adapt accordingly.

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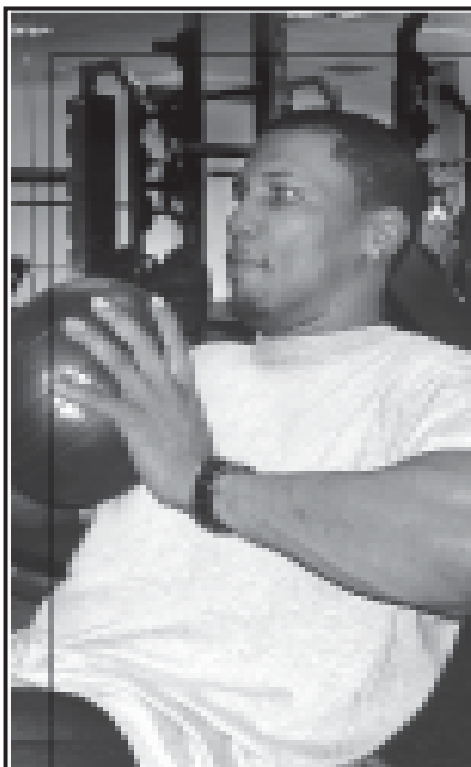
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